Amendments to the Claims:

Claims 1 - 123 (Canceled)

124. (Currently amended) A medical prosthesis for use within a body, said prosthesis being formed of radiation treated ultra high molecular weight polyethylene having cross-links and multiple melting peaks, wherein the multiple melting peaks are a result of irradiation-generated heat, thereby reducing crystallinity of the ultra high molecular weight polyethylene**, and wherein the polyethylene has a tensile elastic modulus of less than about 1 GPa**.

125. (Previously presented) The medical prosthesis of claim 124, wherein said ultra high molecular weight polyethylene has three melting peaks.

126. (Previously presented) The medical prosthesis of claim 124, wherein said ultra high molecular weight polyethylene has two melting peaks.

127. (Previously presented) The medical prosthesis of claim 124, wherein said ultra high molecular weight polyethylene has been subjected to heating by irradiation.

128. (Previously presented) The medical prosthesis of claim 124, wherein said polymeric structure has extensive crosslinking so that a substantial portion of said polymeric structure does not dissolve in xylene at 130°C or DECALIN at 150°C over a period of 24 hours.

129. (Previously presented) The medical prosthesis of claim 124, wherein said ultra high molecular weight polyethylene has an initial average molecular weight of greater than about 1 million.

130. (Previously presented) The medical prosthesis of claim 124, wherein said prosthesis is constructed and arranged for replacement of a joint selected from the group consisting of a hip joint, a knee joint, an elbow joint, a shoulder joint, an ankle joint and a finger joint.

131. (Previously presented) The medical prosthesis of claim 124, wherein said ultra high molecular weight polyethylene has a polymeric structure with less than about 50% crystallinity and less than about 940 MPa tensile elastic modulus, so as to reduce production of fine particles from said prosthesis during wear of said prosthesis.

132. (Currently amended) Radiation treated ultra high molecular weight polyethylene having multiple melting peaks and cross-links, wherein the multiple melting peaks are a result of irradiation-generated heat, thereby reducing crystallinity of the ultra high molecular weight polyethylene**, and wherein the polyethylene has a tensile elastic modulus of less than about 1 GPa**.

133. (Previously presented) The ultra high molecular weight polyethylene of claim 132, wherein said ultra high molecular weight polyethylene has three melting peaks.

134. (Previously presented) The ultra high molecular weight polyethylene of claim 132, wherein said ultra high molecular weight polyethylene has two melting peaks.

135. (Previously presented) The ultra high molecular weight polyethylene of claim 132, wherein said ultra high molecular weight polyethylene has been subjected to heating by irradiation.

136. (Previously presented) The ultra high molecular weight polyethylene of claim 132, wherein said ultra high molecular weight polyethylene has a unique polymeric structure characterized by less than about 50% crystallinity and less than about 940 MPa tensile elastic modulus.

Claims 137 - 149 (Withdrawn)